

Prepare of standard solution - 5M 250 ml NaCl

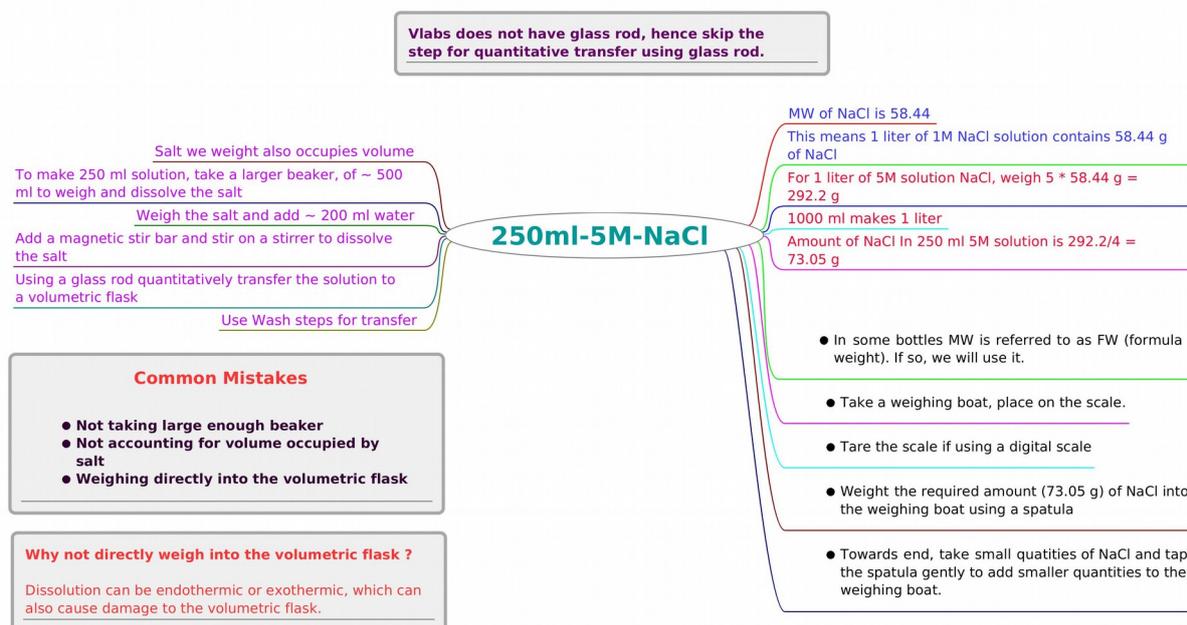
In this experiment, we will prepare a standard solution of 5M, 250 ml NaCl. We will take molecular weight of NaCl as 58.44 g. This number will be written in the bottle and labeled as MW or FW.

The following steps that are involved will be described,

1. Concept map with the following concept sections are described

- Calculation of weight of NaCl needed
- Weighing the NaCl
- Concepts in dissolving salt for preparation of standard solution
- Make up the solution in a beaker or conical flask
- Concepts on glass rod and quantitative transfer

Concept map for preparation of 250 ml 5M NaCl



1. Calculation of weight of NaCl needed

- MW of NaCl is 58.44
- This means 1 liter of 1M NaCl solution contains 58.44 g of NaCl
- For 1 liter of 5M solution NaCl, weigh $5 * 58.44 \text{ g} = 292.2 \text{ g}$
- 1000 ml makes 1 liter
- Amount of NaCl In 250 ml 5M solution is $292.2/4 = 73.05 \text{ g}$

2. Weighing the NaCl

- In some bottles MW is referred to as FW (formula weight). If so, we will use it.
- Take a weighing boat, place on the scale.
- Tare the scale if using a digital scale
- Weight the required amount (73.05 g) of NaCl into the weighing boat using a spatula
- Towards end, take small quantities of NaCl and tap the spatula gently to add smaller quantities to the weighing boat.

3. Make up the solution in a beaker or conical flask

- Salt we weight also occupies volume
- To make 250 ml solution, take a larger beaker, of ~ 500 ml to weigh and dissolve the salt
- Weigh the salt and add ~ 200 ml water
- Add a magnetic stir bar and stir on a stirrer to dissolve the salt
- Using a glass rod quantitatively transfer the solution to a volumetric flask
- Use Wash steps for transfer

4. Make up the solution in a beaker or conical flask

- Transfer the solution to the standard flask using a glass rod
- Rinse the beaker with little water and transfer again
- Repeat 2-3 times to achieve quantitative transfer
- Using a wash bottle add water dropwise, till the lower meniscus aligns with the 250 ml mark.
- Close with the stopper and gently mix by inversion, without foaming.
- Make sure not to spill any solution.

5. Concepts in not dissolving salt the standard flask

- Dissolution can be endothermic or exothermic, which can also cause damage to the volumetric flask.

6. Concepts on glass rod and quantitative transfer

- Vlabs does not have glass rod and wash bottle, hence skip the step for quantitative transfer using glass rod and the wash bottle steps.
- Vlabs accepts a single transfer for without wash for quantitative transfer.